BY ORDER OF THE COMMANDER OKLAHOMA CITY AIR LOGISTICS COMPLEX

OKLAHOMA CITY AIR LOGISTICS COMPLEX MANUAL 90-107

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Special Management

OC-ALC QUALITY MANUAL

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This manual addresses the requirements of the following standards: International Organization for Standardization (ISO) 9001:2015, *Quality Maintenance Systems – Requirements*, Society of Automotive Engineers (SAE) Aerospace Standard (AS) AS9110B, *Quality Maintenance Systems– Aerospace – Requirements for Aviation Maintenance Organizations*. This manual applies to all of the Oklahoma City Air Logistics Complex (OC-ALC). The manual does not include Air Force Reserve Command (AFRC) and Air National Guard (ANG) units. Refer recommended changes and questions about this publication to the Office of Primary Responsibility (OPR) using the Air Force (AF) Form 847, *Recommendation for Change of Publication*, which may be obtained from the AF ePublications web site. Ensure that all records created as a result of processes prescribed in this publication are maintained in accordance with (IAW) AF Manual (AFMAN) 33-363, *Management of Records*, and disposed of IAW the AF Records Disposition Schedule (RDS). This manual is available in electronic media only. It may be obtained from the AF e-publishing web site. It is the responsibility of the user to ensure they are working with the most current version.

SUMMARY OF CHANGES

This is a rewrite; please review the document in its entirety. Changes include the addition of the 76 Software Maintenance Group (SMXG) Quality Management System requirements.

Chapter 1

PROGRAM OVERVIEW

1.1. General. This manual describes the Quality Management System utilized by OC-ALC to consistently provide conforming product, meet statutory and regulatory requirements, and enhance customer satisfaction.

1.2. QMS scope. OC-ALC depot organizations accomplishing overhaul/repair/modification of military aircraft, aircraft components, and aerospace engines for the Department of Defense (DoD) weapon systems and support activities. Within 76th Software Maintenance Group (SMXG), the scope is defined as "The design, development, implementation, and management of Life Cycle Processes for the development and maintenance of software supplied to the 76 SMXG customers."

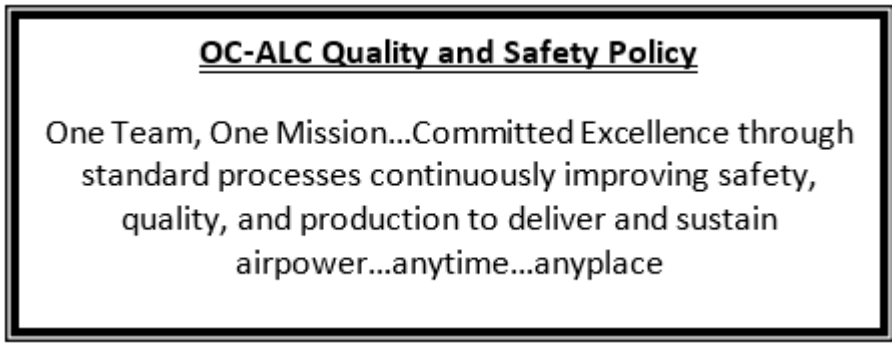
1.3. Application. Limitations to scope of certification to the standard are as follows:

1.3.1. Limitations to AS9110B: The OC-ALC has neither responsibility nor authority to select, approve, or reapprove suppliers. These activities are conducted by various AF organizations outside of the OC-ALC control, which include but are not limited to contracting directorate and the Defense Contract Management Agency (DCMA). Therefore, only paragraph 7.4.1. c. applies and the remainder of clause 7.4.1 is not applicable. This non-applicability does not affect the organization's ability or responsibility to provide products meeting customer and/or regulatory requirements.

1.3.1.1. 76th Aircraft Maintenance Group (AMXG), 76th Commodities Maintenance Group (CMXG), 76th Propulsion Maintenance Group (PMXG), and 76th Maintenance Support Group (MXSG) does not have Cognizant Engineering Authority; therefore, clause 7.3 is not applicable to those Groups. 76 SMXG does execute clause 7.3, which is detailed in paragraph 7.3 of this instruction.

1.4. OC-ALC Quality and Safety Policy. Figure 1. OC-ALC Quality and Safety Policy provides a point of reference for the Complex missions, goals, and objectives.

Figure 1.1. OC-ALC Quality and Safety Policy.



Chapter 2

REFERENCES

2.1. References. Required and related publications supporting corresponding ISO clauses are identified on a Documentation Matrix (DM) available on the Complex Quality Office (OC-ALC/QA) enterprise information management (EIM) site. This matrix clearly shows the corresponding relationship between the AS9110B clauses and the supporting documentation.

Chapter 3

RESOURCES, TERMS, ACRONYMS AND THEIR DEFINITIONS

3.1. Resources, Terms, Acronyms and Their Definitions. Definitions given in AS9110B apply. For additional terms, acronyms and definitions refer to Attachment 1.

Chapter 4

QUALITY MANAGEMENT SYSTEM

4.1. General Requirements. OC-ALC has established, documented, and implemented the QMS which is represented by this manual and continually improves its effectiveness IAW the requirements of AS9110B. For Federal Aviation Administration (FAA) part 145 workload performed in the OC-ALC, refer to the OC-ALC Repair Station Manuals. Questions concerning FAA part 145 workload should be addressed to the OC-ALC Repair Station Accountable Manager located in OC-ALC/QA. For a visual depiction of the interrelated processes at OC-ALC see OC-ALC Visual Aid (OC-ALCVA) 90-107, *Organization Process Flow*, Attachment 2.

4.1.1. OC-ALC Facilities. OC-ALC operates its production, maintenance, engineering, and support facilities at Tinker Air Force Base (TAFB), Oklahoma. The Complex has identified its enterprise processes and determined their sequence and interaction. The Complex ensures the availability of resources and information necessary to support the operation and monitoring of these processes. Analysis of the monitoring and measuring of results will drive necessary actions to achieve planned results and continual improvement.

4.1.2. Organizational Processes. The OC-ALC Enterprise Process owners are 76 AMXG, 76 CMXG, 76 PMXG, 76 MXSG, 76 SMXG, Business Operations (OB), Financial Management (FM), Director of Staff (DS), Safety (SE), Technical Director Engineering (EN), and Quality Assurance (QA). Management is responsible for identifying their business processes and knowing how they sequence and interact with other associated QMS processes. Also, individual process owners are responsible for knowing how their processes sequence interacts with other related processes. It is recommended that process owners utilize process mapping as a means to demonstrate process identification and interaction.

4.1.3. Outsourced Processes. Where OC-ALC chooses to out-source processes that affect product conformity with requirements, it shall ensure control over them. These controls shall be identified within the QMS. The requirements are governed by Federal Acquisition Regulation (FAR), Defense Federal Acquisition Regulation Supplement (DFARS), Air Force Federal Acquisition Regulation Supplement (AFFARS), DoD directives (DoDDs), and AF 63- and 64-series.

4.2. Documentation Requirements.

4.2.1. General. This OC-ALC Quality Manual contains the Quality and Safety Policy and the scope of the Complex's QMS. The manual identifies the OC-ALC Quality and Safety objectives, references documented procedures, and records required by OC-ALC and AS9110B. Within 76 SMXG, quality system documentation is maintained electronically on the SMXG Process Center which is located on the 76 SMXG SharePoint site. This includes directives (organizational policy) and processes. The directives include: D13-01, *Standard Group Process and Deployment*, D13-02, *Process Performance Objectives*, D14-01, *Internal Process Audit Requirements*, D14-02, *Corporate Board Battle Rhythm.*

4.2.1.1. OC-ALC ensures personnel have access to QMS documentation and are aware of relevant procedures.

4.2.1.2. QMS documentation includes any requirements imposed by applicable regulatory Authorities. IAW contract or regulatory requirements, OC-ALC shall coordinate document changes with customers and/or authorities. Customer and/or regulatory authority representatives shall have access to all QMS documentation.

4.2.2. OC-ALCMAN 90-107, *Quality Manual (QM)*. OC-ALCMAN 90-107 is established and managed by OC-ALC/QAI. This manual is maintained as an official publication and is available on AF e-publishing.

4.2.3. Official Documents. All OC-ALC documentation is reviewed, approved and maintained IAW AFMAN 33-363, Management of Records (publishing website). For work governed by the OC-ALC Repair Station Manuals, the accountable manager is responsible for making/approving changes and forwarding the revisions to the FAA/Flight Standards District Office (FSDO) for review and acceptance. The revisions will be implemented immediately. This ensures documents are current, available, and removed when invalid or obsolete. Within 76 SMXG, control of Customer Program/Project (CP/P) documentation (which includes how documents are identified, controlled, approved, and issued) is described in the Configuration Management and Data Management, and Stakeholder Involvement sections of each Project's Work Plan. The 76 SMXG Performance Management Board (PMB) is the approving body for organizational processes. Approvals of organizational processes are recorded in the applicable PMB meeting minutes.

4.2.3.1. Work Control Documents (WCDs). WCDs are maintained IAW AFSCMAN 21-102, *Depot Maintenance Management* and local organizational instructions. WCDs are initiated, controlled, and maintained by the Inventory Tracking System (ITS) or through the Programmed Depot Maintenance Scheduling System (PDMSS).

4.2.3.2. Maintenance, Revision, Change, or Supplementation of Technical Orders (TOs) and Process Orders (POs). The documented procedure for changing technical data is located in and accomplished IAW TO 00-5-1, *Air Force Technical Order System* and TO 00-5-3, *Air Force Technical Order Life Cycle Management* (TO viewing library - internal) and POs IAW AFI21-102_AFMCSUP, *Depot Maintenance Management.*

4.2.3.3. Availability and Distribution of Documentation. Documents and Information Management Tools (IMTs) or forms used to support activities of the QMS shall be controlled. Availability of documentation is generally obtained from AF, AFMC, AFSC and OC-ALC EIM sites. When obtained, the documentation is considered official and represents the most recent version. Printed copies may be made for user reference. IAW TO 00-5-1 and IAW AFSCMAN 21-102. Printed copies may only be used after verifying their currency. Document OPRs and Publications/Forms managers are responsible for ensuring the latest version is posted to appropriate web site. Documents referenced in this manual (e.g., AF, AFMC, AFSC, Tinker and OC-ALC) are available on the AF e-publishing web site link: **http://www.e-publishing.af.mil/**. Organizational Publications/Forms Managers are responsible for maintaining current organizational publications and forms.

4.2.3.4. Web Content. OC-ALC and AF Portal web site's content is considered controlled documentation. Web content shall be managed to ensure currency and accuracy IAW AFI 33-115, *Air Force Information Technology (IT) Service Management.*

4.2.3.5. Master List/Index. A master list/index of documentation shall be maintained at each organizational level where documents and or forms are generated (e.g., Unit, Section, Branch, Division, and Complex). It will indicate the document/form number, title, OPR, release date, and last review date. It will be available electronically on each organization's web page or other media accessible to its personnel. It shall be updated as revisions or cancellations to documents are made or new documents published. Information Management Tools (IMTs) or Forms. AFMAN 33-360 establishes the policy for developing and managing IMTs/forms. IMT forms are available on Tinker Homepage Link: **https://wwwmil.tinker.af.mil/tafbforms/Docs/HTM/electronicIMTs.htm**. Documents referenced in this manual (e.g., AF, AFTO, DD, AFMC, and OC-ALC) are available on the e-publishing web site link: **http://www.e-publishing.af.mil/**.

4.2.4. Control of Records. Completed IMTs are considered records. Records are maintained to demonstrate conformance to QMS requirements and shall be managed IAW AFMAN 33-363 and AFI 33-322, *Records Management Program.*

4.2.4.1. Retention of Records. Electronic and hardcopy records are retained IAW their governing directives and guidance available in AFRIMS database.

4.2.4.2. Supplier Records. Records generated by government contracts shall be IAW FAR,4.805, *Storage, Handling, and Disposal of Contract Files*, FAR web site and AFRIMS database is located at e-publishing web site. Subject records shall be available for review and audit.

Chapter 5

MANAGEMENT RESPONSIBILITY

5.1. Management Commitment. OC-ALC is set up as a multi-level/tiered organization. Complex, Group, and Squadron organization commanders/directors are responsible for their respective organizations. They report to the next level up with the Commander, Vice Director and/or Deputy Commander of Maintenance having overall authority. Together they comprise the Complex's top management. Management supports the QMS by providing the resources for its development and implementation. Top management is instrumental in the development and communication of the quality/safety policy and the establishment of OC- ALC's goals and objectives. Management conducts reviews of the QMS. Within 76 SMXG, the 76 SMXG Corporate Board (CB) provides senior management oversight and direction for critical business issues across the organization IAW the CB Charter. The subordinate Boards to the CB organize Group experts and key stakeholders in order to address CB identified business issues. A Sub-Board operates IAW the Sub-Board's Charter.

5.2. Customer Focus. Top management ensures customer needs, expectations, and requirements are determined and fulfilled with the aim of enhancing customer satisfaction. This is accomplished by communicating the importance of meeting customer, statutory and regulatory requirements throughout the Complex. Customer requirement metrics are reviewed and communicated to the customer during management/performance production meetings. Within 76 SMXG, contractual documents are reviewed and approved as defined in the CP/P's Work Plan, Stakeholder Involvement section. All stakeholders review the requirements to ensure they are clearly defined and obtainable per the customer's requirements. All resource requirements are coordinated with appropriate stakeholders prior to proceeding with any contractual matters.

5.3. Quality Policy. The OC-ALC Quality and Safety Policy (Figure 1.) applies to all civilian employees and military personnel. This statement embodies the very essence of our support to our customers; establishes the framework for setting and reviewing the Complex quality and safety objectives; and provides a commitment to improve the QMS.

5.3.1. Communication. The quality/safety policy is communicated across the organization via banners, email, bulletins, and other forms of communication. All employees are expected to understand this policy and how it applies to them and their work. The policy is reviewed annually and documented in the employees AF Form 971, *Supervisor's Employee Brief,* folder.

5.3.2. Review. The quality/safety policy is reviewed for suitability and adequacy as directed by top management.

5.4. Planning.

5.4.1. Quality Objectives. OC-ALC has set its quality objectives to meet customer contractual requirements (delivery schedules, product quality) and strive to accomplish continuous process improvement (CPI). The quality objectives, in conjunction with the Quality and Safety Policy, are to provide products and services on time, within budget, and defect free. Processes within the quality system include a broad range of aspects centered on the complexity of the work, methods used, skills and training needed by personnel involved

in accomplishing the mission and providing effective Warfighter support through speed, quality, and cost.

5.4.2. QMS Planning. Top management ensures planning of the QMS is carried out in order to meet requirements of AS9110B, AF regulations, and Complex quality objectives. The integrity of the QMS is monitored through management review. When changes are made or should changes to the system be planned, management is responsible for ensuring risk assessments are accomplished and necessary resources allocated to maintain the integrity of the QMS. Top management, may establish requirements for groups relating to QMS planning within their respective organizations. As a minimum, group top management shall:

5.4.2.1. Appoint organizational approval authority (OAA) as contact point/facilitator for validation of identified QMS deficiencies and changes. OAA duties are as stated in OCALCI 90-420, *Corrective Action Tracking System (CATS)* and OC-ALCI 90- 120, *Internal Audit System.*

5.4.2.2. Ensure quality planning, to include Risk Management (RM), is accomplished as appropriate to their organization given changes to the Complex QMS.

5.4.3. Complex Safety Objectives:

5.4.3.1. Product Safety: Achieve safe products through conformance to applicable technical data and prescribed publications. The objectives are measured by the quality assurance surveillance plan (QASP), routine inspections (RIs), management inspections (MIs), special inspections (SIs) quality verification inspections (QVIs), personnel evaluation (PEs), and trend analysis based on quality deficiency reports (QDRs).

5.4.3.2. Personnel Safety: Ensure a safe and healthy work environment through adherence to Occupational Health and Safety Administration (OSHA) and Air Force Occupational Safety and Health (AFOSH) standards. The objectives are measured by various processes including, but not limited to: Total Incident Case Rate (TICR), Days Away, Restricted or Transferred (DART), and personnel safety.

5.5. Responsibility, Authority, and Communication.

5.5.1. Responsibility and Authority. The QMS regulations, instructions, and process documents define the responsibilities and authorities for the Complex enterprise processes (para 4.1.2.). Direct lines of authority are reflected in OC-ALC organization chart located on the OC-ALC website.

5.5.1.1. Accountable Executive Manager. The Complex Commander appoints by memorandum the Accountable Executive Manager who has the authority to ensure all ordered maintenance can be financed, the necessary resources obtained, and all ordered maintenance completed IAW all organization, customer and relevant authority requirements (appointee located on OC-ALC website).

5.5.1.2. Maintenance Manager. The Complex Commander appoints by memorandum the Maintenance Manager who has responsibility for assuring all maintenance required is carried out IAW OC-ALC, customer and relevant authority requirements.

5.5.2. Management Representative. The Complex Commander appoints by memorandum the management representative for the Complex as defined in AS9110B (Appointee located on OC-ALC web site). The management representative ensures processes comprising the

QMS are established and maintained; performance and improvement needs are reported to top management during the management reviews; and acts as the OPR for the review and maintenance of this manual. As revisions to the standard are first introduced, the management representative will ensure an action plan is implemented to update the QMS and the quality manual.

5.5.2.1. Authority. The management representative has the organizational freedom to resolve matters pertaining to quality and promotes awareness of customer requirements throughout the organization.

5.5.3. Internal Communication. Top management ensures communication channels are established within the organization and communication takes place regarding the effectiveness of the QMS by conducting management reviews, communicating customer requirements, measuring QMS effectiveness, and publicizing accomplishments. Within 76 SMXG, Each CP/P conducts a combination of internal and customer reviews throughout its life cycle as documented in the CP/P's Work Breakdown Structure (WBS).

5.6. Management Review (MR).

5.6.1. General. Management Review (MR) is a multi-level/tiered process incorporating reviews held at the Complex, Group, and Squadron levels. Each organization is responsible for their portion of the Complex objectives and reporting to their commander/director the health of each. Records of these reviews will be maintained at the respective multi-level/tier relevant to the tier (e.g., e-mails, briefing charts, sign-in sheets, etc.). Within 76 SMXG, the quality system is reviewed within the CB/PMB meetings IAW the Group Board Operations (GBO) Process. Any quality system issues which cannot be adequately addressed during a CB meeting are documented and tracked as action items in the CB meeting minutes. CB meetings are conducted IAW the Group Battle Rhythm which is developed by the Group Director, Deputy Director, Squadron Directors, Branch Chiefs, and Engineering Process Group (EPG). MRI reporting also provides insight into the performance aspects of the quality system.

5.6.2. Review Input. The review includes, but is not limited to, results of audits occurring since the last review, customer and other external feedback, data and information regarding the performance of processes and the conformance of products, status of any preventive and corrective actions, follow-up actions from earlier management reviews, planned changes that could affect the QMS, recommendations for improvement, product safety, achievement, adequacy, and effectiveness of the personnel training programs and changes to authority requirements that could impact the organization. Within 76 SMXG, the EPG reviews the Process Center (PC) annually IAW the Process Engineering and Improvement (PEI) Process and provides results to the Performance Management Board (PMB). The Quality Engineering Support Team (QuEST) provides results of audits to the PMB IAW the Internal Audits (IA) Process. The EPG and QuEST review results get rolled up and presented to the CB. Group management reviews MRIs monthly IAW the Management Review Indicators Process and Standard.

5.6.2.1. Level of Briefing. All open Corrective Action Requests (CARs) shall be briefed at the level to which the finding was issued (i.e., Complex, Group, or Squadron. CARs identified during external/internal Complex-level audits will be included in the QA's quarterly MR. These CARs are to be considered open action items until closed and

subject briefings shall include the Corrective Action Plan (CAP), to include milestones if implementation period is over 180 days and implementation progress to date.

5.6.2.2. Corrective Action Status. Open CARs issued at the group level and below will be briefed monthly to management at the level the CAR was issued. Complex- level and below MR briefings will include, at a minimum, the planned completion date, current status, and if implementation period is over 180 days, include CAP with milestones and mitigation actions taken during implementation of CAP.

5.6.3. Review Output. The results of management reviews include decisions and actions related to improvement of the QMS effectiveness and its processes, improvement of product related to customer requirements, and resource needs. Within 76 SMXG, all decisions and action items discussed during CB, MRI, and/or CP/P meetings are documented in meeting minutes. All action items are tracked to closure.

5.7. Safety Policy. The Complex Quality/Safety policy (Figure 1.) is appropriate to the purpose of the OC-ALC. It fosters compliance with a commitment to continuously improve, is measurable and communicated throughout the organization by means of banners, internet, newspaper, etc., and is reviewed on a regular basis.

Chapter 6

RESOURCE MANAGEMENT

6.1. Provision of Resources. OC-ALC determines and provides resources needed to implement and improve QMS effectiveness and to ensure customer satisfaction by meeting customer requirements. Tools, tech data, facilities, materials, and qualified personnel are continually assessed to ensure safe completion of maintenance activities. Within 76 SMXG, the Personnel Working Group under the direction of the Resource Management Board has the responsibility to develop and/or maintain an environment with qualified personnel to perform technical work as required within the organization. The Personnel Working Group operates IAW the Resource Management Board Charter and periodically reports to the CB.

6.2. Human Resources.

6.2.1. General. Competency of all personnel performing work affecting product quality at OC-ALC is evaluated on the basis of applicable education, training, experience and demonstrated skills. Persons requiring authority certification shall meet and maintain applicable eligibility requirements. Non-certified personnel, who are performing maintenance operations are closely supervised and the work is approved by certified personnel. Within 76 SMXG, personnel performing software and/or hardware work have met educational requirements in order to qualify for a position. Additional On-the-Job Training (OJT) and structured training are provided as required by job series and/or internal roles IAW the Training Management (TM) Process.

6.2.2. Competence, Awareness and Training. Quality civilian training and development programs are essential in maximizing the efficiency of civilian employees in the performance of their jobs. Within 76 SMXG, the Education Training Management System (ETMS), Training Scheduling System (TSS) and Organizational Training Database (OTDB) are systems used within the organization to request, track, and document training necessary for personnel performing software activities. Flight chiefs are responsible for creating and maintaining training plans for each employee. The flight chiefs identify the training per each position's requirements and ensures the employee receives the required training per the employee's training plan. All employee training is identified, planned, tracked, and evaluated for effectiveness IAW the Training Management Process.

6.2.2.1. Basic policies for identifying and conducting civilian training and education to ensure organizational, occupational, and individual performance requirements can be found in AFI36-401, *Employee Training and Development*, AFI36-2650_AFMCSUP, *Maintenance Training* to ensure employees are able to adequately perform the responsible duties defined in their job descriptions, supervisors will identify tasks to be performed, required training and maintain records of individual competencies.

6.2.2.2. Specific guidelines governing the minimum requirements and the standardized criteria for maintenance training related to product can be found in AFI21-102_AFMCSUP and AFI36-2650_AFMCSUP. For training requirements dealing with FAA repair station workload, refer to the OC-ALC Repair Station Training Manual (OC-ALC/QA EIM site). The organization maintains records of education, training, skills, experience and certification as appropriate to job requirements. Employees are made

aware of the relevance and importance of their activities and how they contribute to achieving the Complex quality goals and objectives through the use of plasma screens, shop media, shop meetings, etc. Job duties and responsibilities along with the knowledge, skills and abilities required are outlined in detailed job descriptions specific to individual jobs on AF Form 1003, *Air Force Core Personnel Document.*

6.2.2.3. Semi-annual and annual performance reviews are conducted for all OC-ALC personnel and are maintained in their AF Form 971.

6.2.2.4. Human Factors. OC-ALC recognizes personnel performing maintenance tasks are affected by certain human factors such as physical fitness, physiological characteristics, personality, stress, fatigue, distraction, communication, and attitude. The 72d Medical Group, under the 72d Air Base Wing (72 ABW), provides personnel services at the occupational medicine facility and a health and wellness Center, which addresses some human factors (72 AMDS web site). AFI 91-204 *Safety Investigations and Reports* details the requirements of the Department of Defense Human Factors Analysis and Classification System. Elements of human factors are continually evaluated and training provided. Examples of training include human factors computer based training, job safety training (JST), wingman program (including wingman boldface), quarterly safety briefings, bio-environmental surveys, hazard communication (HAZCOM) program and recurring training requirements (RTR). Elements are tailored to each work center based on workplace hazards and weapon system engineering requirements. Supervisors must be able to provide evidence of applicable training elements in their area. AFI 91-203, *Air Force*ictect*Consolidated Occupational Safety Instruction and Activities,* along with general and weapon specific TOs incorporate human factors notes and warnings.

6.3. Infrastructure. OC-ALC determines, provides and maintains the infrastructure needed to achieve conformity to product requirements. Acquiring and maintaining infrastructure, which includes facilities and equipment, provides the foundation for Complex operations. Acquisition and maintenance of facilities primarily comes under the purview of 72 ABW/CE, which oversees all real property requirements. This includes: buildings, workspace utilization, associated utilities, and supporting services. Equipment assets facilities planning associated with product realization is under the purview of the OC-ALC. The Plant Management organization tracks and maintains plant and industrial equipment assets used in support of product realization. Facility and equipment maintenance is a combination of contractor/in house activity. When work is performed away from OC-ALC it is incumbent on the customer to provide suitable facilities where the work will be accomplished.

6.4. Work Environment and Safety. Work environment is the set of conditions under which work is performed. OC-ALC strives to maintain a work environment that is safe and contributes to the productivity of the workforce while achieving product requirements. This includes appropriate controls on temperature, humidity, lighting, cleanliness, protections from electrostatic discharge, noise, etc. Other factors addressed are tool control, foreign object/dropped object damage control, aerospace ground equipment usage, special tooling/fixtures, fuels storage/handling, ergonomics, protective equipment, safety guidelines and non-destructive inspection areas. Complex will determine and implement the appropriate work environment to support operations, management and administration activities.

Chapter 7

PRODUCT REALIZATION

7.1. Planning of Product Realization. OC-ALC plans and develops product processes and the associated documentation which facilitates product realization. Each organization is responsible for providing evidence of the effectiveness of their processes. This is accomplished by providing evidence (records) resources are planned for concerning the realization of product, as well as the process and product itself meeting quality/safety goals and objectives and customer requirements that have been established IAW AFI21-102_AFMCSUP, and AFSCMAN 21-102. Within 76 SMXG, the CP/P plans its work after selecting a CP/P scenario IAW the EM CP/P Process, Process Asset Library (PAL) Configuration Checklist. The scenario details the PAL processes and standards which will be used during execution of the CP/P. The processes include all necessary planning and engineering processes used during the development of the product. The PAL processes define the work products to be produced within the process and records which must be maintained. For Test Program Set (TPS) legacy projects the TPS Life Cycle Guide (LCG) defines two scenarios, maintenance and development. Depending on which scenario is selected determines which processes the CP/P will follow and what records are maintained.

7.1.1. Project Management. This is accomplished by the respective System Program Office in support from the Maintenance Complex.

7.1.2. Risk Management. All organizations within the Complex performing their piece of product realization planning are required to use the guidance found in the Air Force Risk Management (RM) program, Air Force Policy Directive 91-2, *Safety*ictect*Programs* and AFI 90-802, *Risk Management.* Risks are identified and addressed at each appropriate level through self-assessment programs, management meetings, production meetings, Quality Assurance Surveillance Plans (QASPs), routine internal and external audit briefings, and management review. Note: Product risk is managed by the customer using safety guidance found in Mil Std 882D Standard Practice for System Safety (IHS site), AFMCI 63-1201, Implementing Operational Safety Suitability and Effectiveness (OSS&E) and Life Cycle Systems Engineering (LCSE).

7.1.3. Configuration Management (CM). CM is accomplished by adhering to customer requirements through implementation of project directives, statements of work, technical data/guidance, which are owned and controlled by LCMC. The Complex uses WCDs and applicable information systems, e.g., Comprehensive Engine Management Systems (CEMS), Reliability and Maintainability Information System (REMIS), to support CM.

7.1.4. Control of Work Transfers. OC-ALC uses the guidance found in AFI 63-101/20- 101, *Integrated Life Cycle Management* for the Depot Source of Repair (DSOR) process, and AFSCMAN 21-102, to transfer work internally and externally. Instructions are located on AF e-Publishing web site.

7.2. Customer-Related Processes.

7.2.1. Determination of Requirements Related to Product. Requirements and any associated risks (e.g., new technology, short delivery time scale) are reviewed with the customer to ensure needs, expectations, cost/price, schedule, and other parameters that impact product quality, customer acceptance, customer satisfaction and risks are mutually understood and

achievable. Requirements related to the product are supplied by the customer through project directives, work specifications, memorandum of agreements/understandings. Requirements not identified by the customer but necessary for specified or intended use will be addressed, where known. Determination of applicable statutory and regulatory requirements will be addressed (reference FAR Part 44, maintenance contracts include the scope of work, delivery requirements and requirements regarding subcontracting of work). Within 76 SMXG, requirements which determine the scope of a project are documented in two ways depending on whether the CP/P is a maintenance or development effort. For maintenance efforts, each customer issue is identified and documented as an Investigation Report (IR) IAW the Customer Support Process (CS). The IR becomes an input into the Requirements Analysis (RA) Process where it is further documented as an Analysis Report (AR) and validated and accepted by the customer for inclusion into the CP/P's maintenance effort. For development efforts, each customer issue is documented as an Analysis Report for Development (AR (DEV)) IAW the Requirements Analysis for Development Process. The customer validates and accepts applicable ARs (DEV) for inclusion in the development effort. The CP/P further documents all valid requirements on a Requirements Traceability Matrix (RTM). During the execution of the CP/P's engineering life cycle, requirements from the ARs or RTM are periodically reviewed with the customer in formalized customer meetings and/or prototyping (where applicable). Review activities are documented as per the process in which the review is being conducted.

7.2.1.1. Partnering. OC-ALC partnership workload with non-government entities will have authorizations and responsibilities listed in the associated Partnership and Implementation Agreements (PA & IA). For agreements with other government entities, the authorizations and responsibilities will be listed in the Depot Maintenance Inter-service Agreement (DMISA), Memorandum of Agreement (MOA) or Memorandum of Understanding (MOU).

7.2.2. Review of Requirements Related to Product. The pre-production planning team (PPPT) accomplishes the product requirements review. The review includes the following: statement of work, planned workload processes, risk management, contracting, purchasing, scheduling, inventory management, and/or control functions, correspondence, customer requirements, contractual requirements, delivery requirements, workload negotiations, including pre-quotation activities (i.e., rough order of magnitudes, etc.), and other functions as required. Guidance for this planning process is AFSCMAN 21-102, which includes records. Within 76 SMXG, amendments to required contract documents are handled within the affected CP/P or responsible Program Office (PO). The amended contract is resubmitted for approval by the approving organization and re-delivered to all appropriate organizations. Re-planning within a CP/P is performed IAW the Tracking and Control (TC) and Program Management (PM) Processes. For legacy projects, re-planning is performed IAW the TPS LCG. Records of contractual documentation and related contract meetings are maintained within the CP/P.

7.2.3. Customer Communication. System Program Office (SPOs) are the focal point of communications between the Complex and MAJCOMs. Communication between the production planning team (PPT) and the SPOs handles/resolves any product information, enquiries, contracts, order handling, including amendments. (Communication is via work specification review, routine production/planning meetings). Customer feedback (negative)

shall be entered into the Joint Deficiency Reporting System (JDRS) IAW TO 00-35D-54, *USAF Deficiency Reporting, Investigation, and Resolution.* Within 76 SMXG, each CP/P handles customer communication in a variety of ways including telephone communications, emails, letters, customer agreements, customer reports, customer presentations, and formal meetings. Communications are conducted and documented IAW the Program Management and engineering processes located on the PC.

7.3. Design and Development (D&D). See Paragraph 1.3.1.1 for applicability. SMXG will perform the following:

7.3.1. Selection of a PAL scenario is documented by the CP/P on the PAL Configuration Checklist IAW the EM CP/P process. The scenario chosen defines all planning, management, design, development, verification, and validation processes necessary for realization and delivery of the product. Estimation of resources, planning schedules, and identification of risks are performed IAW the Project Planning Process. All PAL processes and planned work is documented and managed in the CP/P's Work Breakdown Structure (WBS). The CP/P also prepares a Work Plan IAW the Project Planning Process. The CP/P's Work Plan describes stakeholder involvement which includes all stakeholder roles and responsibilities listed by process events and major milestones. This section also includes stakeholders identified in applicable Customer Agreements such as the Memorandum of Agreement (MOA), Roles and Responsibilities Section. The Work Plan contains additional information including development schedules, resources, scope of work to be performed, known project and product interfaces, design considerations, tracking and control of the project, engineering environment, quality assurance, and configuration management. The Work Plan is monitored throughout the life of the CP/P and revised as necessary.

7.3.2. Design and Development Inputs. Requirements, which determine the design input, are provided by customers specific to the project. Some of the requirement documentation includes Release Definition Document, Requirements Specification, SOW, Software Change Proposal (SCP), Software Support Requirements Documentation, Software Configuration Control Sub-Board (SCCSB) Approval Form, and Material Improvement Project (MIP). Requirements are turned into detailed design inputs and documented in an Investigation Report/Analysis Report (IR/AR) for maintenance efforts or an AR for development efforts. The ARs are presented to the customer for validation, review, and customer acceptance IAW the Requirements Analysis Process for maintenance efforts or the Requirements Analysis for Development Process for development efforts. Once approved, ARs are placed under configuration control IAW the Manage CP/P Repositories activity of the CM/DM Process. For TPS legacy projects, all design and development inputs are documented and presented to the customer for validation, review, and customer acceptance IAW the TPS LCG, TPS Requirements Analysis and Planning activities.

7.3.3. Design and Development Outputs. Requirements identified in the Requirements Analysis or Requirements Analysis for Development Processes are documented in the RTM. The RTM is a requirements map used to trace requirements to design, implementation, integration, and acceptance tested ensuring that all agreed upon customer requirements are included in the final product. Outputs of the Detailed Design or Detailed Design for Development Processes include an Engineering Folder, Design Package, Test Plan, Test Procedures, and RTM. These outputs become inputs and outputs into the Implementation and Integration Processes during execution of the life cycle. Outputs of the Acceptance

Testing Process include the Product Package and Acceptance Test Report. The final product out of the Product Delivery Process includes the Delivery Package and Version Description Document. The Delivery Package includes all baseline product components and any customer support documentation intended for delivery with the product. The Version Description Document describes product identification and release information important for safe and proper use of the product.

7.3.4. Design and Development Review. Design and development reviews for the CP/P are planned at the beginning of the project IAW the Project Planning Process. Design and development reviews are conducted throughout the engineering life cycle IAW the Design, Integration, and Acceptance Testing Processes. Peer Reviews, Preliminary Design Reviews (PDRs), Critical Design Reviews (CDRs), Customer Status Reviews, Test Readiness Reviews (TRRs), and Acceptance Testing are some of the reviews conducted with key stakeholders. All reviews are documented and stored in the CP/P's engineering folder. The work products may include meeting minutes, action items, and updates to design packages, test plans, test procedures, test results, and any other supporting materials generated during the review. The work products are placed under configuration control IAW the CM/DM Process.

7.3.5. Design and Development Verification. Verification activities planned in project planning and documented in the CP/P's WBS are performed IAW the Integration Process. During execution of this process, all product components which have been integrated into the product are verified to ensure all requirements have been met. A variety of verification activities takes place such as peer reviews or technical reviews, verification of functionality IAW the test plan and test procedures, and TRRs. Results of reviews are recorded in the engineering folder, test plan and test procedures (as applicable), product package, and RTM. All records are placed under configuration management control IAW the CM/DM Process.

7.3.6. Design and Development Validation. Validation activities planned in project planning and documented in the CP/P's WBS are performed IAW the Acceptance Testing Process. A variety of validation activities take place including the Acceptance Test, Configuration Audit, completion of Test Plan and Test Procedures, and Technical Order and RTM validation. Results of activities are recorded in the Engineering Folder, Acceptance Test Report, product acceptance forms, and Product Package. All records are placed under configuration management control IAW the CM/DM Process.

7.3.7. Control of Design and Development Changes. Design and development changes for maintenance or development efforts may occur during any part of the engineering life cycle. The RTM is reviewed and updated as necessary throughout the engineering life cycle. Any changes to the RTM are reviewed and approved by the appropriate stakeholders. Design changes are also documented in the Engineering Folder and Product Package (which includes any customer engineering change forms if applicable). All design changes are subject to peer review or technical reviews as appropriate. All records are placed under configuration management control IAW the CM/DM Process.

7.4. Purchasing. The directorate of Contracting is responsible for ensuring compliance with statutory and regulatory requirements (e.g., DDFARS, and AFFARS [all FAR Site website]), implementing procurement and contracting policy and directives, and for exercising applicable

fiscal and administrative controls over the entire procurement function which is outside OC-ALC's area of authority/responsibility.

7.4.1. Purchasing Process. See Paragraph 1.3.1 for applicability information. The Complex shall comply with requirements of TO 00-35D-54, when receiving parts/material from suppliers which do not meet specified requirements. Within 76 SMXG, purchasing of a product and/or service from a supplier is performed IAW the Project Planning Process, Plan for Suppliers activity. The Plan for Suppliers activity addresses all documentation needed to acquire the product/service and information required by the CP/P to monitor the performance or maintain the product from the supplier. The CP/P maintains all records relating to the acquisition of the product and/or service IAW the CM/DM Process. The identification of the need for a supplier and the definition of requirements for the product or service are defined by the proposal or the Program Management, Design, or Design (DEV) Process. This activity is not intended for small purchases of low-cost general purposed parts, materials, supplies, or maintenance/support services.

7.4.2. Purchasing Information. The Complex ensures requisitions adequately describe the products to be procured prior to request. This typically includes the nomenclature, part number and/or stock number. Within 76 SMXG, a CP/P prepares an Acquisition Package IAW the Project Planning Process, Plan for Suppliers activity. This package contains all requirements, decisions, documentation, and forms necessary for the purchase of the product and/or service. Further information regarding suppliers is described in the CP/P's Work Plan, Supplier Agreements section. This section includes an overview of purchase requests, SOW and/or MOA for suppliers, purchase options, supplier requirements, who the stakeholders are, and how monitoring of suppliers is accomplished. Stakeholder identification, roles, and approvals for the purchased product and/or service are identified in the CP/P's Work Plan, Stakeholder Involvement section.

7.4.3. Verification of Purchased Product.

7.4.3.1. OC-ALC, through the various supply documents (e.g., DD Form 1348-1A, *Issue/Receive Document*, supply status tags, certificate of conformance (CoC), etc.), verifies product received meets order requirements. This may include inspections, tests, review and verification of part numbers, kit numbers and national stock numbers of the product received. Supply documents are retained to support recall process if required. Within 76 SMXG, verification of purchased products and/or services is performed IAW the Tracking and Control Process, Execute Tracking and Control activity, Monitor Suppliers. Details of verification activities may also be included in the SOW or MOA for suppliers as well as the CP/Ps Work Plan, Supplier Agreements section. All incoming products are inspected upon receipt per the product requirements identified in the Acquisition Package to verify the product meets requirements.

7.4.3.2. There is currently no provisions/authority for the Complex to conduct onsite verification at the supplier's premises. The customer or the customer's representative, DCMA, has the right to verify the conformance at the supplier's premises or on the Complex's premises.

7.4.3.3. Verification and approval of the supplier's product by a customer does not absolve the Complex of responsibility to provide acceptable product, does not preclude

subsequent rejection by the customer. Complex has the responsibility to provide an acceptable product regardless of customer supplier verification and approval process.

7.5. Production and Service Provision.

7.5.1. Control of Production and Service Provision. The Complex controls for production and service provisions are through adhering to customer requirements, AF publications, WCDs/instruction, router, and technical data, in addition to adhering to applicable FAA regulations on FAA Part 145 repair station workload. (Ref the appropriate OC-ALC repair station manual). Non-critical processes (those not directly affecting the quality of the product) may require documentation, and as applicable, may be adequately covered by training and the employee's ability to adequately demonstrate proficiency. All written procedures must comply with OSHA, EPA, Safety, and Occupational Health requirements (whichever is more stringent). OC-ALC is compliant with the Foreign Object Damage (FOD) and Dropped Object Prevention (DOP) Programs which are managed IAW AFI 21-102. Within 76 SMXG, the Software Control Center (SCC) is responsible for the storage, replication, and distribution of software released to the customer. The control of production and service provision is handled IAW the SCC Process. All software received is stored in a controlled environment, the Master Repository, from which all copies for distribution to the customer are made. SCC Process handles the number of copies, labeling, packaging, shipping, and all the accompanying documentation to the customer. Installation of the software is the responsibility of the customer and is handled IAW the applicable TO or operational procedure.

7.5.1.1. Maintenance Process Verification. New maintenance processes shall be documented and qualified by the process engineer with the approval of the cognizant engineering authority.

7.5.1.2. Control of Maintenance Process Changes. Complex process changes are controlled by the AFMC Form 202, *Nonconforming Technical Assistance Request and Reply Process*, AFTO 22, *Technical Manual (TM) Change Recommendation and Reply Process*, process orders, production planning teams, and CPI IAW the following guidance: AFMCMAN 211, *Air Force Materiel Command Technical Order System Procedures,* TO 00-5-Series, AFI21-102_AFMCSUP, and AFMCI 90-104, *Implementing AFSO21 Initiatives.* Product conformity is evaluated throughout the recommended change process to confirm desired effect has been achieved, without adverse effects to product conformity.

7.5.1.3. Control of Maintenance Equipment, Tools and Programs. All maintenance equipment shall be managed IAW TO 00-20-14, *AF Metrology and Calibration Program* (AFMETCAL web site), and OCALCI 21-203, *Equipment Maintenance/ Inspection and documentation*. Tooling will be managed IAW AFSCMAN 21-102. Software programs are controlled IAW Process Orders (POs) from each organization (e.g., 76 CMXG PO 05-02, 76 PMXG PO 99-001).

7.5.1.4. Post Delivery Support. When discrepancies are discovered post-delivery, they will be entered in the Joint Deficiency Reporting System (JDRS) and investigated IAW TO 0035D-54. Any post-delivery repairs authorized/performed at OC-ALC or off site, will be IAW available Technical Data to AFI21-102 and/or SPO approval.

7.5.2. Validation of Processes for Production and Service Provision. OC-ALC validates all processes for production where the resulting output cannot be verified by subsequent monitoring or measurement. Such processes are considered to be "special". The OC-ALC Technical Director, along with the group engineering authorities, are responsible for identifying all maintenance processes considered to be special and they are listed IAW AFSCMAN 21-102. Special Processes are supported by process orders. Process orders are initially validated, reviewed every two (2) years, and revalidated as necessary due to events which could affect the process. Records of special processes validation and revalidation shall be maintained (paragraph 4.2.4.). Within 76 SMXG, the PMB is the oversight body responsible for process control within 76 SMXG. The CB approves all PC processes and changes IAW the GBO Process. Process approvals are documented via a PAL Update Request (UR) and documented in the CB meeting minutes. Responsibility for validation of CP/P processes and procedures not resident on the PC are defined in the CP/P's Work Plan, Stakeholder Involvement section. All process changes are managed and recorded IAW the CM/DM Process and the CP/P's Work Plan, Configuration Management and Data Management section.

7.5.3. Identification and Traceability.

7.5.3.1. Material transactions at OC-ALC are performed IAW guidance in AFI 23-101, *Air Force Material Management*. AF and customer property is tagged or labeled to indicate identity, condition, status, configuration and other pertinent information. Material transactions between depot supply and the Complex are accomplished and tracked by the G402A - Exchangeable Production System (EPS), G004L - Job Order Production Master System (JOPM), and D035K Wholesale and Retail Receiving and Shipping System (WRRS). Material within the Complex is tracked by G337 Inventory Tracking System (ITS), Aircraft Parts Tracking System (APTS) and Total Component Management (TCM) by use of a unique inventory tracking number. Within 76 SMXG, product identification and traceability of the product is accomplished through the entire life cycle of the product. Throughout the maintenance and/or development of the product, the CP/P identifies and tracks all work products developed within the engineering life cycle IAW the engineering processes. Work products are controlled IAW the CM/DM Process and the CP/P's Work Plan, Configuration Management and Data Management section. This includes internal work products, acquired tools, Track/Control Packages, Product Baselines, Configuration Status Accounting (CSA) Reports, Configuration Audit Reports, and the Work Plan. Once ready for release to the customer, the software is delivered to the SCC who provides the official baseline configuration management and secure storage of software media and documentation. The SCC serves as the master repository for all weapon system software/documentation as well as the distribution point of the software/documentation. The software/documentation is assigned a unique identifier IAW the Air Force Computer Program Identification Number (CPIN) System, USAF Automated CPIN (ACPINS) System, TO 00-5-16, and TO 00-5-1. Records are maintained in the ACIPN System. Revisions are identified, documented, and authorized by the customer. Local CPIN activities are performed IAW the SCC Process.

7.5.3.2. Identification of parts/material used during depot maintenance processes is controlled by elements of configuration management through utilization of technical data,

work control documents, routers, supply documents, and AF data bases (e.g., REMIS, CEMS,).

7.5.4. Customer Property. OC-ALC ensures products and intellectual property furnished by customers are verified, identified, stored, protected and maintained properly IAW guidance in AFSCMAN 21-102. Customer property that is lost, damaged or found to be unsuitable for use shall be recorded and the customer notified of their property's status. Within 76 SMXG, when Government Furnished Equipment (GFE) CPIN software products are received, the SCC controls the baseline of that customer supplied product. When products come from the customer that are not part of the product baseline package but are used in the development or production of delivered products, the product is placed under configuration control IAW the CP/P's Work Plan, Configuration Management and Data Management section, and the CM/DM Process.

7.5.5. Preservation of Product. OC-ALC preserves the product and constituent parts during processing and delivery, which includes handling, packaging, shelf life, storage, and preservation IAW general and weapon system specific Tech Data, AF publications, Environmental Protection Agency (EPA) and OSHA directives. Shelf life items are not used for final product assemblies. Within 76 SMXG, the SCC is responsible for software/documentation receiving and storage, software/documentation order processing, software/documentation duplication/distribution, and software duplication/verification problem and resolution. All baseline software/documentation is assigned a CPIN number upon receipt. The software/documentation is stored in the SCC's master repository which is a secured and controlled environment accessible only by authorized personnel. All media received is verified to ensure the media is readable and reproducible IAW the SCC Process. Once a formal request for software is made by the customer, the SCC duplicates, labels, and packages software/documentation IAW the SCC Process. When the method of delivery is shipping, it is accomplished IAW Air Force mailing requirements for the level of classification being shipped.

7.6. Control of Monitoring and Measuring Devices. Where monitoring and measuring devices are required to maintain valid results, subject equipment shall be calibrated and traceable IAW AFI 21-113, *Air Force Metrology and Calibration (AFMETCAL) Management* and TO 00-20-14, *AF Metrology and Calibration Program* (AFMETCAL web site).

Chapter 8

MEASUREMENT, ANALYSIS AND IMPROVEMENT

8.1. General. Organizations will plan and implement monitoring, measurement, analysis and improvement processes. This is accomplished through a combination of planning elements, WCDs, process orders, surveillance, analysis, and feedback programs. These activities shall: Ensure compliance to product requirements, ensure conformity to the QMS and continuously improve processes.

8.2. Monitoring and Measurement.

8.2.1. Customer Satisfaction. The Complex analyzes and measures customer satisfaction in relation to product conformity, customer feedback positive/negative, and corrective action requests is accomplished from information provided by JDRS, which is the official avenue of communication from the user to our customers (Life Cycle Management Center (LCMC) and Supply Chain Management Wing (SCMW) IAW TO 00-35D-54. Internal and external communication pertaining to on-time delivery performance and other business related analysis is addressed through various levels of management reviews. Electronic AFMC Form 77, *Request for Quality Assistance (RQA*) is also used to resolve internal and external customer satisfaction issues. Within 76 SMXG, customer satisfaction is monitored in many ways including customer surveys, periodic meetings with the PO throughout the life cycle, user's conferences, product or business working groups, formal reviews, testing activities, and organizational strategic goals. Records of these activities include surveys, problem reports, emails, and meeting minutes.

8.2.2. Internal Audit. The QMS shall be audited at planned intervals IAW OC-ALCI 90120. The OC-ALC/QAI audits maintenance programs (e.g., tools, WCDs, safety, training, etc.) and functions of staff offices (e.g., planning, engineering, training, etc.). OC-ALC group quality perform audit and inspections of product realization (e.g., process audits, (MIs), QVIs), (SIs), (PEs) IAW AFSCMAN 21-102. These audits determine if the QMS is working effectively and are IAW AS9110B, OC-ALC, and higher headquarter requirements. Results of previous audits along with statistical analysis and importance of area is taken into consideration when developing audit schedule/plan. Frequency of OC-ALC audits shall be reflected in a yearly audit schedule made available on OC-ALC/QA EIM web site. The Complex/Group Quality audits will be identified on their quarterly QASP. The OC-ALC/QA's program is audited yearly by the Complex ISO/AS Registrar. Within 76 SMXG, internal process compliance audits within the CP/Ps are planned and performed IAW the Internal Audits Process and the CP/Ps Work Plan, Quality Assurance section. Process audits are performed by the QuEST which is independent of the CP/Ps being audited. Results of all audits are recorded and available to audit participants. Resolution of audit findings and re-audits are performed IAW the Internal Audits Process. Audit status and results are provided to the CB and EPG IAW the Process Management CP/P Work Plan, Measurement and Analysis section.

8.2.3. Monitoring and Measurement of Processes. OC-ALC shall develop and utilize suitable methods to evaluate the QMS processes' ability to achieve planned results. Corrective action shall be taken to ensure conformity, safety and reliability of product, where processes are

found to be nonconforming corrections shall be made to include action to prevent recurrence, reference and the OC-ALCI90-420 and IAW AFSCMAN 21102 and QIMSS database. Within 76 SMXG, internal audits are conducted to monitor and measure process compliance of PAL processes. Audits and corrective actions are performed IAW the Internal Audits Process. Audit reports are provided to the CB and EPG IAW the Process Management CP/P Work Plan, Measurement and Analysis section. Process related monitoring and measurement are accomplished IAW the CP/P Indicator Standard, MRI Process and MRI Standard. 76 SMXG periodically benchmarks against the Capability Maturity Model Integrated for Development (CMMI-DEV) to assess process capabilities and identify process improvements. An assessment report is provided to the organization at the conclusion of a Standard CMMI Assessment Method for Process Improvement (SCAMPI) appraisal.

8.2.4. Monitoring and Measurement of Product. Product characteristics, including key characteristics, shall be monitored and measured at appropriate stages to ensure quality/conformity. Defects identified during planned maintenance, which is outside contract scope, shall be processed IAW customer and Authority requirements. Records management includes incoming records, product realization records, and required records for the customer as end item products. The Complex accomplishes these requirements by adherence to comprehensive utilization of work control processes recorded on appropriate documents (e.g., PPT documentation, WCDs, AFMC Form 202s, AFMC Form 206, AFMC Form 343s, test results, audit reports, supply documents, etc.) which includes review of these processes and documents. Records shall be maintained as evidence of conformity, which will identify person(s) authorizing product release, reference IAW AFSCMAN 21-102. Within 76 SMXG, Software requirements tracked in the RTM are verified in the final product prior to release IAW the Acceptance Testing Process to ensure that customer needs have been met. Results of acceptance testing are documented in the Acceptance Test Report and the Product Package IAW the Acceptance Testing Process. Product related monitoring and measurement are accomplished IAW the CP/P Indicator Standard, MRI Process, and MRI Standard.

8.3. Control of Nonconforming Product. Governing directives have been developed to ensure nonconforming product is prevented from inadvertent use or delivery. Control provides for identification, documentation, evaluation, segregation, disposition and notification of areas affected. Controls, responsibilities and authorities for dealing with nonconforming product have been procedurally defined in AFMCMAN 21-1, *Air Force Material Command Technical Order System Procedures,* **Chapter 5**, *Engineering Disposition for Nonconforming Technical Problems Beyond Published Authority, and* TINKERAFBI21- 99, *Processing of AFMC Form 202.* Nonconforming product shall be dealt with by the organization in one of the following ways while developing records (e.g., MDR, SDR, PQDR, AFMC Form 202s, MRB, etc.) as appropriate, take action to eliminate nonconformity through rework; request approval for use from cognizant engineering authority; release, or acceptance under concession (repair) if authorized by the customer; or take action to preclude original intended use or application (scrap, re-grade); or seek disposition instructions. When nonconforming product is corrected, it shall be subject to re-inspection. The nature of the nonconformity and subsequent action shall be recorded along with the disposition instructions. Appropriate action (evaluation for recall) shall be taken and recorded when nonconformity is discovered after product delivery. Nonconformance findings and improvement opportunities shall be reported to management in the area of responsibility. Findings of major significance may be immediately reported to senior

management. Nonconforming product will be segregated from conforming product IAW AFI 21102_AFMCSUP and pertinent local instructions. Within 76 SMXG, any product defects discovered during the engineering life cycle not associated with current product requirements are documented in an IR IAW the Customer Support Process. An investigation of the defect is performed IAW the IR/AR Standard and a decision is made by relevant stakeholders to fix the defect in the existing product baseline or defer to another release. Results are documented in the IR and are managed and tracked to closure IAW the CM/DM Process.

8.4. Analysis of Data. Organizational decisions are based on information obtained by analysis of data. Sources of this data include, but are not limited to, the following areas: customer satisfaction indicators both internal and external, QMS indicators, process/product results and human factors events. AFI 91-204 *Safety Investigations and Reports* details the requirements of the Department of Defense Human Factors Analysis and Classification System. Analysis techniques are based on their applicability to the data set being analyzed and range from the most basic, such as Pareto charts and flowcharts, to more sophisticated applications, such as statistical process controls. Results of the data analysis will determine appropriate corrective and preventive actions, resulting in CPI. Within 76 SMXG, all CP/Ps collect and analyze data regularly IAW the CP/Ps Indicator Standard, MRI Process, and MRI Standard. This data covers metrics associated with engineering of software products and services provided to the customer. MRIs are reported on a monthly basis to senior management.

8.5. Improvement. Senior management continually improves the effectiveness of QMS through preventive action initiatives, response to customer complaints, and the management review process. Corrective, preventive and improvement opportunities are reported at the level affected. Findings of major significance affecting the QMS may be immediately reported to senior management. Actions and any associated metric analyses shall be reported to applicable management.

8.5.1. Continual Improvement. Continual improvement processes are used to ensure long-term viability of the QMS in supporting accomplishment of Complex mission, goals and objectives. Various techniques are employed based on individual group/squadron/flight requirements and results. Methodology includes but is not limited to Lean, Six Sigma, AFSO21 Projects, 8 Step Problem Solving, Innovative Development through Employee Awareness (IDEA) program, process audits/evaluation, benchmarking.

8.5.2. Corrective Action (CA). OC-ALC takes appropriate and timely action to eliminate the cause of nonconformities in order to prevent recurrence.

8.5.2.1. Audit Findings. As it pertains to the Complex's internal audit program (paragraph 8.2.2.), per OCALCI 90-420. All findings associated with the Complex internal and external audit activity are documented and corrective action accomplished within CATS utilizing an OC-ALC Form 531, *Corrective Action Request (CAR)*, and OC-ALC Form 531-1, *Root Cause Analysis (RCA) Worksheet*.

8.5.2.2. Quality Assurance Surveillance Plan Findings. As it pertains to product and product processes related nonconformities, corrective action is accomplished. All findings associated with product processes are documented and corrective action AFSCMAN 21102 and accomplished within the QIMSS database utilizing an AFMC Form 343, *Quality Assurance Assessment*.

8.5.2.3. Unit Self-Assessment Program. This program enables OC-ALC organizations to identify and assure compliance with higher regulatory and statutory requirements. It is administered IAW AFI 90-201, *The Air Force Inspection System* and IAW AFSCMAN 21102. Documentation of findings and corrective action is maintained in the MICT database. Additional information may be obtained from the Self-Assessment Program EIM site.

8.5.2.4. Supplier-Related Findings. Non-conforming parts received from supply will be reported IAW TO 00-35D-54 and non-conforming material will be reported IAW the applicable 23-series supply directives.

8.5.2.5. Human Factors. When it is determined human factors were a cause of a nonconformance, flow down of the corrective action shall be accomplished to RCA IAW OCALCI 90-420. Within 76 SMXG, several methods of corrective action can be used based on the type of corrective actions necessary. Corrective actions can occur anywhere within the engineering life cycle. The corrective actions include execution of a CAR, Internal Audit, Process Assessment Report, Investigation Report, External Deficiency Reporting, the CM/DM Process, EM Forms, or Process Asset Maintenance.

8.5.3. Preventive Action. Preventive Actions (PAs) are taken to eliminate potential nonconformities. Actions taken to prevent injury of personnel, damage to equipment/parts, potential bottle necks in processes, or even missing targets/goals are a few examples of preventive actions. (e.g., installing trailing edge padding, changing oil, buying second piece of equipment, rapid improvement event, pre-production planning, risk management, technical reviews). OC-ALCI 90-115, *Preventative Action System* documents the procedures OCALC uses to identify and resolve potential non-conformities. Within 76 SMXG, preventive actions are handled in numerous ways depending on where the CP/P is in the engineering life cycle. The preventive actions include execution of a CAR, Peer/Technical Review, Process Assessment Report, or the Risk Management Process.

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Attachment 1

GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION

References

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OC-ALCI90-115, *Preventative Action System,* 24 Mar 2016

OC-ALCI90-420, *Corrective Action Tracking System*, 1 May 2014

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TO 00-5-1, *AF Technical Order System,* 1 Oct 2014

TO 00-5-3, *Technical Manual Acquisition Procedures* 1 Apr 2015

TO 00-20-14, *AF Metrology and Calibration Program*, 30 Aug 2014

TO 00-35D-54, *USAF Deficiency Reporting, Investigation, and Resolution,* 1 Sept 2015

Prescribed Forms

None

Adopted Forms

DD Form 1348-1A, *Issue/Receive Document*

AFTO 22, *Technical Manual (TM) Change Recommendation and Reply*

AF Form 971, *Supervisor's Employee Brief* (available thru base supply)

AF Form 1003, *Air Force Core Personnel Document*

AFMC Form 202, *Nonconforming Technical Assistance Request and Reply*

AFMC Form 206, *Temporary Work Request*

AFMC Form 343, *Quality Assurance Assessment*

AFMC Form 77, *Request for Quality Assurance*

OC-ALC Form 531, *Corrective Action Request*

OC-ALC Form 531-1, *Root Cause Analysis Worksheet*

Abbreviations and Acronyms

AF—Air Force

AFFAR—Air Force Federal Acquisition Regulation

AFI—Air Force Instruction

AFMAN—Air Force Manual

AFMC—Air Force Materiel Command

AFMCI—Air Force Materiel Command Instruction

AFRIMS—RDS —Air Force Records Information Management System Records Disposition Schedule

ANSI—American National Standard Institute

APTS—Aircraft Parts Tracking System

CATS—Corrective Action Tracking System - database

Cert C—Certified Current

CC—Commander

CM—Configuration Management

D&D—Design and Development

DFAR—Department of Defense Federal Acquisition Regulation

DoD—Department of Defense

D035K—Wholesale and Retail Receiving and Shipping System (WRRS) – database

DR—Deficiency Report

DSOR—Depot Source of Repair

ETIMS—Enhanced Technical Information Management System

FAA—Federal Aviation Administration

FAR—Federal Acquisition Regulation

G402—Exchangeable Production System (EPS) - database

G004L—Job Order Production Master System (JOPM) - database

G337—Inventory Tracking System (ITS) - database

IAW—In Accordance With

IDEA—Innovative Development through Employee Awareness

IMT—Information Management Tool

ISO—International Organization for Standardization

ITS—Inventory Tracking System

LCMC—Life Cycle Management Center

MR—Management Review

OAA—Organizational Approving Authority

OC—ALC — Oklahoma City Air Logistics Complex

OC—ALC/CC — Oklahoma City Air Logistics Complex Commander

OI—Operating Instruction

PO—Process Order

PDM—Programmed Depot Maintenance

PR—Purchase Request

QA—Quality Assurance

QIMSS—Quality Information Management Standard System – database

QM—Quality Manual

QMS—Quality Management System

QP—Quality Policy

RM—Risk Management

SAE—Society of Automotive Engineers

SCMW—Supply Chain Management Wing

TAFBI—Tinker Air Force Base Instruction

TAFBM—Tinker Air Force Base Manual

TCM—Total Component Management

Terms

Audit—A planned/unplanned examination of a function carried out either by determining conformance to procedures in process or by critical analysis of the product or service that is the results of the process.

Authority—The national aviation authority having jurisdiction over the manufacturer, aircraft owner and operator, maintenance organization; the Authority could be civil or military.

Business Process—A collection of related, structured activities or tasks that produce a specific service or product for a particular customer or customers can also be referred to as a Production Process.

Calibration—A comparison between items of equipment, one of which is a measurement standard of known accuracy, to detect, correlate, adjust, and report any variation in the accuracy of the other items.

Complex Management Representative—A member of management appointed by the commander and chartered with the responsibility of ensuring that the quality system is established, implemented, and maintained and assuring the timely reporting on the system through a Complex-level MR.

Continual Improvement—A continuous search for methods to improve the QMS. Also, it is procedures in use to prevent nonconforming product occurrence.

Corrective Action—: The process of identifying a problem, assigning responsibility, determining the root cause, developing a plan to correct the problem and taking action to eliminate the root cause so as to prevent recurrence. The intent is to eliminate the cause of the nonconformity in order to prevent recurrence.

Document—Any paper or electronic media used to contain or store information (i.e. policies, procedures, drawings, technical orders, process orders, work control documents, work instructions, etc.) as evidence of a documented quality system.

Human Factors—Recognition that personnel performing tasks are affected by physical fitness, physiological characteristics, personality, stress, fatigue, distraction, communication and attitude.

Inspection—An activity such as measuring, examining, testing, or gauging one or more characteristics of an entity, and comparing the results with specified requirements in order to establish whether conformity is achieved for each measurable characteristic.

Instructions—Provide essential procedural guidance to implement Air Force policy in the field. Instructions direct action, ensure compliance, or provide detailed procedures for standard actions across the Air Force.

ISO Standards—The International Organization for Standardization's documented agreements containing technical specifications or other precise criteria to be used consistently as rules, guidelines, or definitions of characteristics to ensure that materials, products, processes, and services are fit for their purpose.

Key Characteristics—The features of a material, process, or part whose variation has a significant influence on product fit, performance, service life, or manufacturability.

Maintenance—The overhaul, repair, inspection, replacement, modification or defect rectification of an aircraft or an aircraft component that is performed after completion of manufacturing and initial airworthiness certification by the applicable Authority.

Management Review—A senior management (Complex/Group/Squadron level) meeting intended to review the overall effectiveness of the quality management system with regard to stated quality goals and objectives.

Nonconformance—The non-fulfillment of a specified requirement associated with the product or service provided. Any condition which renders a product unusable, indicating that it does not meet specifications and/or other technical requirements.

Nonconforming Product—A product that does not meet manufacturing specifications, design composition or other contract requirements. The term nonconforming product includes product returned by customer, damaged or worn product and counterfeit and/or suspected unapproved parts.

Office of Primary Responsibility (OPR)—An organization assigned as the central point of contact for a program, project, directive, form, etc.

Official Web Sites—The source of publications and forms is the key to determining whether it is a current, official version. Documents located on organizational websites are considered official documents and are reviewed and updated IAW AFI 33-360. Complex Quality Records generated by the QM are found on the Complex EIM site.

Operating Instruction—Assigns responsibilities, directs actions, and prescribes procedures within a Wing/Directorate, Complex, Division, Branch, Section, or Unit. If a policy affects two or more wing/directorates it must be published as a base-level instruction.

Partnering—A cooperative arrangement between an organic depot-level maintenance activity and one or more private sector entities to perform DoD or Defense-related work and/or to utilize DoD depot facilities and equipment (reference DoDI 4151.21).

Preventive Action—Action taken to identify and eliminate the causes of potential nonconformities (before they occur) or other undesirable potential situation.

Process: A set of inter—related resources and activities which transform inputs into outputs.

Process Owner—The person responsible for a process and its output. They speak for or represent the process in the organization.

Process Mapping—The activity of creating a flowchart adequate to portray a work process showing its inputs, tasks, and activities, in sequence, a graphic representation of a process.

Product—: The result of activities or processes. A product may include service, hardware, processed materials, software, or a combination thereof.

Quality Management System—The QMS is a web of interconnected processes. Each process uses resources to turn inputs into outputs. All of these processes are interconnected by means of many input-output relationships. Every process generates at least one output, and this output becomes an input for another process. These input-output relationships glue all of these processes together and make them into a system.

Quality Plan—A document setting out the specific quality practices, resources, and activities relevant to a particular product, process, service, contract, or project.

Quality System—Organizational structure, procedures, processes, and resources needed to implement quality management.

Record—Records are all books, papers, maps, photographs, machine readable materials, or other documentary materials, regardless of physical form or characteristics, made or received by an agency of the United States Government under Federal law or in connection with the transaction of public business and preserved or appropriate for preservation by that agency or its legitimate successor as evidence of the organization, functions, policies, decisions, procedures, operations, or other activities of the government or because of the informational value of data in them. Library and museum material made or acquired and preserved solely for reference or exhibition purposes, extra copies of documents preserved only for convenience of reference and stocks of publications and of processed documents are not included. (Title 44 U.S.C., Public Printing and Documents, **Chapter 33**, Disposal of Records, Section 3301, Definition of records). (Reference AFI 33-322, paragraph 2). Records provide documented evidence of conformance to specified requirements and the effective operation of the QMS.

Registrar—A company that conducts quality system assessments to ISO management system requirements.

Release Certificate—A document certifying that the activities performed, and the results achieved, conforms to established organization, Authority, and contract requirements.

Root Cause Analysis Worksheet—An OC-ALC Form 531-1, Root Cause Analysis (RCA) Worksheet, used in conjunction with OC-ALC Form 531, Corrective Action Request, to assist in performing an analysis as to the root cause of a nonconformity.

Statistical Technique—A mathematical method dealing with the collection, analysis, interpretation, and presentation of quantitative data.

Technical Data—Data that is necessary to ensure that the aircraft or aircraft component can be maintained in a condition such that serviceability and airworthiness of the aircraft and related operational and emergency equipment, is assured. This data includes maintenance programs, airworthiness directives, service bulletins, major repairs/modifications, operator maintenance manuals, drawings, engineering orders, component maintenance manuals, technical orders, etc.

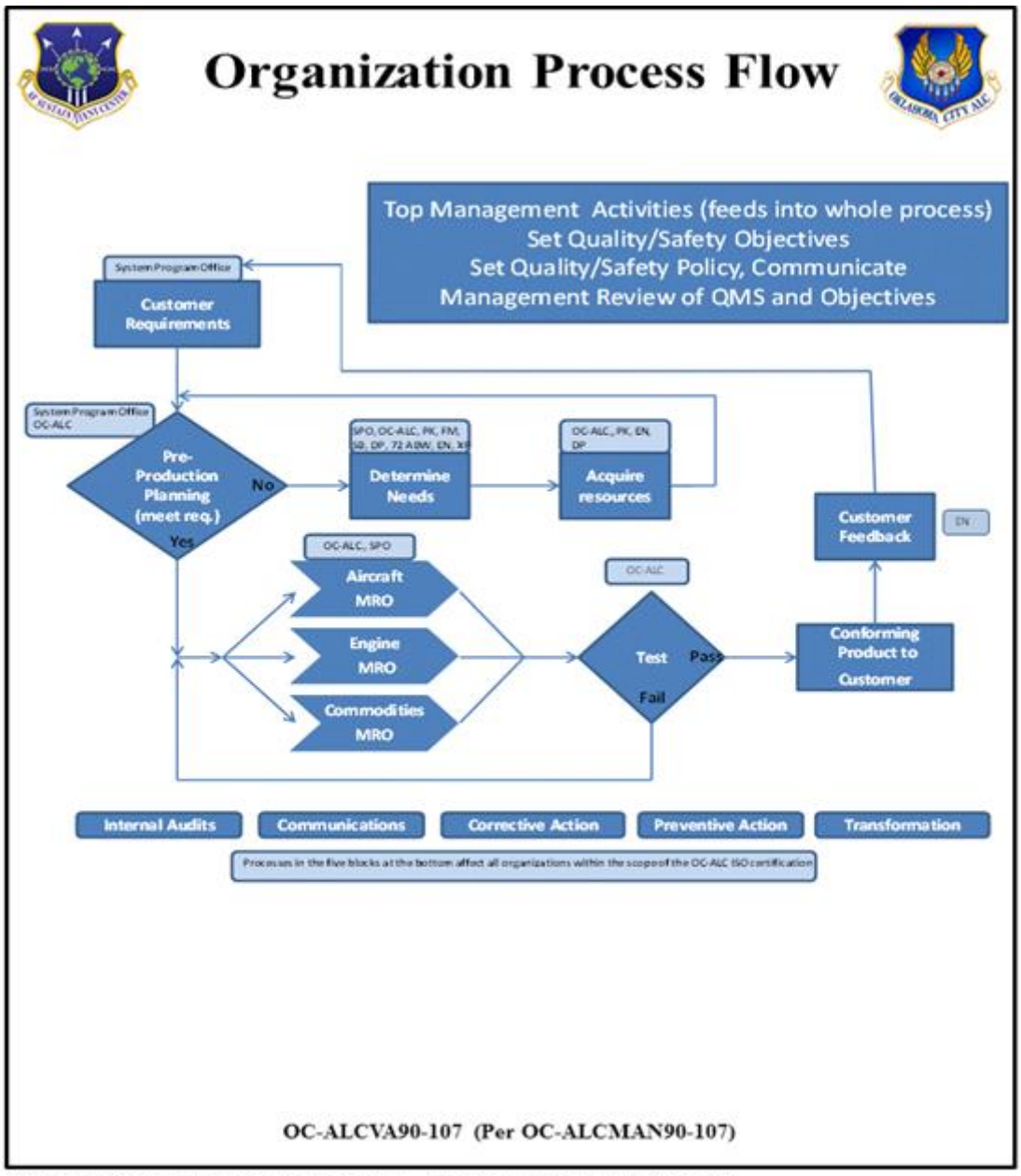
Verification—Confirmation; proof by evidence; check for accuracy.

Work Instruction—A document that presents a detailed description of how tasks or processes are to be performed or conducted to ensure the procedures of the organization are achievable. This could be technical data, standard operating instruction, or other written official publication outlining how tasks or processes are to be performed.

Attachment 2

OC-ALCVA 90-107, ORGANIZATION PROCESS FLOW

Figure A2.1. OC-ALCVA 90-107, Organization Process Flow.



OC-ALC Visual Aid 90-107, 6 May 2014 Previous Versions Are Obsolete